

Retro-costo-xiphoid diaphragmatic hernia – aspects of thoraco-abdominal border surgery

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Abstract.

Morgagni-Larrey hernia represents a particular form of diaphragmatic hernia, characterized by the protrusion of the abdominal organs into the thorax through the sternocostal triangle (foramen Morgagni). Compared to other diaphragmatic hernias, this hernia variety is rarely found, in a proportion of 2-5% of the total diaphragmatic hernias, with a higher incidence in adults (85%) than in children. We present the case of a 60 years old female patient, admitted to the General Surgery Department of the “Bagdasar-Arseni” Clinical Emergency Hospital from Bucharest, diagnosed with such a disease, who underwent a surgical procedure and who presented a favorable outcome.

Keywords: Hernia, Diaphragm, Retro-costo-xiphoid

Introduction

Morgagni-Larrey hernia, known in the literature as retro-costo-xiphoid hernia (1), sub-costo-sternal hernia, retrosternal hernia, parasternal hernia or anterior diaphragmatic hernia (2), represents a particular form of diaphragmatic hernia, characterized by the protrusion of the abdominal organs into the thorax through the sternocostal triangle (foramen Morgagni). Compared to other diaphragmatic hernias, this hernia variety is rarely found, in a proportion of 2-5% of the total diaphragmatic hernias (3), with a higher incidence in adults (85%) than in children (4). In adults, these hernias can be determined by acquired conditions (obesity, pregnancy, constipation, trauma, etc), which increase intra-abdominal

pressure and favor herniation over the years (5-7). Approximately 30% of the cases are asymptomatic and are incidentally diagnosed by investigations or procedures performed

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Received: June 01, 2021; **Accepted:** November 30, 2021; **Published:** December 25, 2021

Citation: Almăjanu-Ciocîlteanu Claudia Marinela, Duțescu Ș, N, Coman I., S., Coman Elena Violeta, Erchid Anwar, Porojan V., A., Bedereag Șt., I, Ciuvică-Tănăsescu Sabina Gabriela, Scarlat Andreea Maria, Grigorean V., T.: Retro-costo-xiphoid diaphragmatic hernia – aspects of thoraco-abdominal border surgery. Journal of Surgery [Jurnalul de chirurgie]. 2021; 17(4): 269 – 273. DOI: 10.7438/JSURG.2021.04.06,

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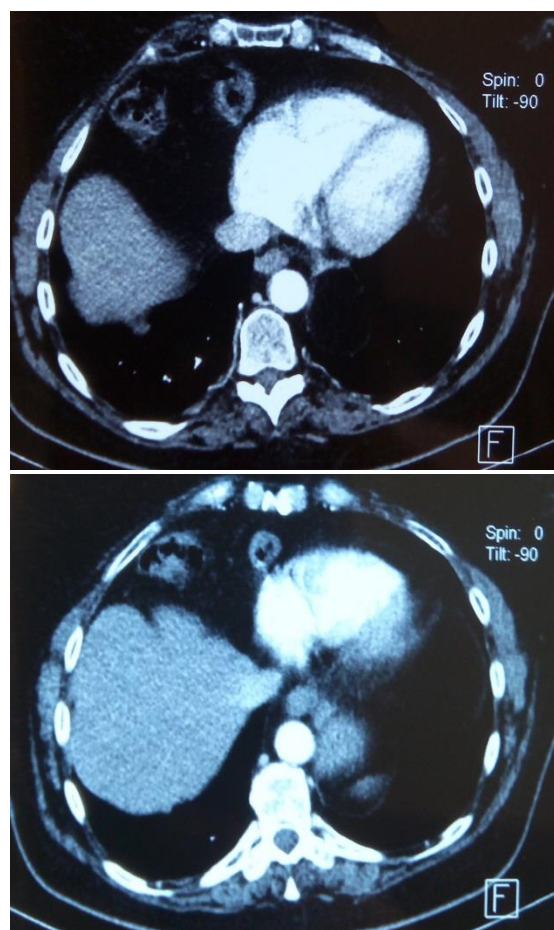
for other associated diseases. If dyspnea, caused by the growing hernia sac, is characteristic for early childhood, retrosternal and thoracic pain are more common in elder patients (8). Usually, the reported symptoms involve abdominal pain, chest pain or obstruction of the herniated organs. If small or large bowel loops are strangulated, an acute abdomen can clinically develop (9).

Case report

We present the case of a 60 years old female patient admitted to the General Surgery Department of the “Bagdasar-Arseni” Clinical Emergency Hospital from Bucharest for pain in the base of the thorax, cough and dyspnea, symptomatology that had begun about 14 days before.

The patient had performed prior to the admittance to our department a thoracic CT (computer tomography) scan, showing a voluminous right ventral transdiaphragmatic hernia (14/9/6 cm (centimeters)), apparently through the dehiscence of the Morgagni triangle, containing loose tissue and a transverse colonic segment, without signs of obstruction, without risk of strangulation (hernia orifice of 3/5 cm), which causes almost complete passive atelectasis of middle right pulmonary lobe and ventilation disorders of smaller severity of the inferior right pulmonary lobe. The herniated pouch has an intimate contact with the pericardium and is tangent to the right atrium (Figures 1,2).

From the patient's personal pathological history, we note chronic constipation, ischemic cardiac disease,



Figurile 1-2. Aspect CT preoperator al herniei Morgagni-Larrey

operated uterine fibroma, and operated acute appendicitis. Laboratory investigations are within normal limits. A cardiological consultation is performed, without finding a cardiac problem related to the proximity of the hernia sac.

Surgery is performed, noticing in the right diaphragm a musculo-aponeurotic defect of 3/5 cm, through which the large omentum and the proximal 2/3 of the transverse colon are herniated in the right thorax (Figure 3).



Figure 3 – Intraoperative aspect of the hernia defect

The omentum and the transverse colon are reintegrated into the peritoneal cavity, the hernia sac is dissected and resected afterwards, the breach is closed by the suture of its edges to the posterior layer of the rectus abdomini muscle sheath and the remaining cavity is drained.

The postoperative outcome is favorable, the drainage tube being suppressed on the 5th postoperative day. The patient is discharged on the 7th postoperative day.

Discussions

Although it is usually asymptomatic in the early years of life, being discovered at the adult and at the elderly, in the etiopathogenesis of the Morgagni-Larrey hernia the congenital factor has a significant importance, due to the occurrence of this area of minimal resistance, with muscular deficiency of the anterior part of the diaphragm. The anatomical congenital defect occurs through the aplasia of the anterior insertions of the diaphragm.

Symptoms of the retro-costo-xiphoid hernias vary greatly, from asymptomatic hernias, discovered by chance during investigations for other diseases, to cases that may present either digestive symptoms or respiratory symptoms (10), or some mixed forms that present both digestive and thoracic signs (11). In the present case, the onset symptoms were respiratory and thus the initial diagnosis was directed towards the pulmonary area.

The insertion of the pericardium explains the frequency of the right muscular defect (our patient's case), a defect that can be unilateral, bilateral, or median, in the last case with the formation of median hernias. The vast majority of Morgagni-Larrey hernias have a peritoneal sac, which contains in about 80% of the cases transverse colon and large omentum. The stomach can also be drawn through the gastro-colic ligament, which at the same time twists it as the hernia grows. Sometimes, inside the sac can be found small bowel, or, more rarely, a part of the liver. The hernia sac is missing in the intra-pericardial hernia variant by direct communication of the peritoneum with the pericardium (pericardo-peritoneal duct) (5). In our patient, the hernia content was bounded by a true hernia sac.

The diagnosis of retro-costo-xiphoid hernia can't be certainly established by clinical examination, the imaging elements being the ones that finally establish this diagnosis. Standard chest radioscopy and radiography provide clear images in case of content with organs belonging to the digestive tract located at the base of the thorax, if these do not reduce in orthostatic

position. Opaque images with the same location belong to the hernias containing large omentum or liver. Barium enema is indicated in case of hernia with colonic contents, while barium gastro-duodenal transit is very useful to determine the position of the stomach. Computer tomography is the imaging method of choice for visualizing the adipose tissue of the large omentum and the air in the digestive tract. The use of the CT scan as a diagnostic tool in patients with Morgagni-Larrey hernia increased therefore the safety of the preoperative diagnosis (8). Taking into account the anatomic and clinical particularities of Morgagni-Larrey hernias, the differential diagnosis will be made with the following pathologies: fatty deposits of the pericardium, hiatal diaphragmatic hernias, Bochdalek hernias, diaphragm traumatic ruptures, diaphragm tumours, anterior mediastinum tumours, pneumonic condensations, mediastinal lymphoma and pericardial cysts (9).

The treatment of the retro-costo-xiphoid diaphragmatic hernia is surgical (10). Some of the authors do not recommend a surgical procedure in asymptomatic patients, while most authors support active surgical attitude in both symptomatic and asymptomatic patients to prevent possible complications (strangulation, enlargement of the herniated sac followed by compression of the mediastinum) and to avoid unnecessary morbidity (6;11;12). However, in elderly asymptomatic patients, surgical intervention can be avoided if the surgical risk has been estimated to be significant (4). The risk of an acute complications such as strangulation or volvulus justifies the indication for radical

surgical treatment, especially since the procedure is in most cases simple and with very good results. The xipho-umbilical median celiotomy provides sufficient surgical comfort for any of the Larrey spaces, whereas the thoracic approach of the retro-costo-xiphoid hernia has an absolute indication in the case of intra-pericardial variety and relative indication in the case of voluminous hernia, left hernia or when the preoperative diagnosis is uncertain. Debates on how to close the hernia defect lie only in direct/tissular repair versus the closure using a protetic material. In case of small defects, some authors prefer non-absorbable separate sutures. Instead, depending on the size of the defect, the preference for the prosthetic procedure also increases (7). In the near future, minimally invasive laparoscopic techniques in continuous improvement, will replace traditional open trans-abdominal methods as a preferred option for a diaphragmatic defect plasty (13).

Conclusions

1. Congenital etiopathogenesis of this type of hernia explains all the variants of diaphragm involvement, from a simple area of weakness, to total aplasia of the anterior diaphragmatic sector. Under these conditions, it may already be present at birth, either as a direct communication of the pleural and peritoneal cavities, or as a simple hypoplasia of the anterior diaphragm.
2. Diaphragmatic hernias are rare clinical entities which, through both cardio-respiratory manifestations and diagnosis difficulties. They represent a severe condition, requiring the resolution of

multiple problems related to possible complications, the choice of operation moment and the surgical procedure, the possibility of the reduction into the peritoneal cavity of the abdominal herniated viscera, the diaphragmatic breach closure tactics, the attitude towards the hernia sac and the postoperative management.

3. Routine radiological explorations may be sufficient to establish the diagnosis, but the “gold-standard” of the diagnostic methods is represented by the CT scan, which increases the safety of the preoperative diagnosis of the given pathology.

4. Although clinical diagnosis is difficult, the surgical solution is relatively simple, with good efficiency and results.

5. The strategy, tactics and surgical technique of the border region to which we refer must respect both the principles of abdominal surgery and the principles of thoracic surgery, which must be adapted to each case and properly combined.

Conflict of Interest

Authors have no conflict of interest to disclose. The study was approved by the Research Ethics Committee of the Clinical of the “Bagdasar-Arseni” Clinical Emergency Hospital, Bucharest, Romania

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